

REMARKS

Claims 1-18, 20, 35 and 37 have previously been canceled; claims 25, 43 and 44 are herein canceled; and claims 19, 23, 26 and 38 are currently amended. Thus, claims 19, 21-24, 26-34 and 36-42 are currently pending.

Claims 43 and 44 have been canceled to address the rejections under 35 U.S.C. §112 as set forth on page 4 of the Office Action.

All pending claims stand rejected based on cited prior art and as set forth in the following four rejections:

1) Rejection I - claims 19, 21-34, 36 and 38-44 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Burgel in view of Tanaka or Masumoto (page 5 of the Office Action);

2) Rejection II - claims 23-34, 36 and 38-44 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Burgel in view of Tanaka or Masumoto or Schaffer or Clark (page 6 of the Office Action);

3) Rejection III - claim 19 also stands rejected as being unpatentable over Yoshinari in view of Tanaka or Masumoto (page 10 of the Office Action);

4) Rejection IV - claims 21-34, 36 and 38-44 stand rejected as being unpatentable over Yoshinari in view of Tanaka or Masumoto or Schaffer or Clark (page 13 of the Office Action).

Response to Rejection I Under 35 U.S.C. §103(a)

On page 5 of the Office Action the Examiner acknowledges Burgel does not disclose that “the precipitation strengthened by the addition of 50 ppm to 2000 ppm of a strength promoter from the group consisting of zinc, tin, lead, gallium, selenium and arsenic.” The Examiner cites Tanaka as disclosing a hard faced nickel base alloy comprising 0.1 to 3% by weight of tin and/or 0.1 to 3% by weight of tantalum. In addition, the Examiner cites Masumoto as teaching a wear-resistant alloy of high permeability having 0.5% of tin. The Examiner’s attention is directed to the amendment to claim 19 including “... a superalloy is precipitation strengthened by the addition of 50 ppm to 500 ppm of a strength promoter.” Claim 23 had been amended to include “...a metallic strength promoter in an amount of 50 ppm to 500 ppm.” Claim 38 has been amended to include “a nickel, cobalt or iron superalloy that is precipitation strengthened by the addition of 50 ppm to 500 ppm of a strength promoter.” Thus, each of the independent claims

19, 23 and 38 has been amended to include a concentration of 50 ppm to 500 ppm of the strength promoter. In addition, independent claim 39 claims a strength promoter at 100 ppm to 500 ppm. That is, each independent claim includes a maximum concentration of 500 ppm (0.05% by wt.) of the strength promoter.

As the Examiner has acknowledged Tanaka discloses a nickel-base alloy having 0.1 to 3% by weight of tin; and, Masumoto teaches a wear-resistant alloy having 0.5% of tin. In view of the above claimed concentration of 0.05% by weight of a strength promoter, Tanaka and Masumoto do not disclose concentrations of tin that overlap the claimed ranges of concentrations of a strength promoter such as tin. Nor do these references provide any suggestion or motivation to one skilled in the art to provide tin as a strength promoter or at the claimed concentration levels. As previously argued by Applicant, the proportions of tin and tantalum as described in Tanaka are not included for the purpose of providing increasing strength to the component by increasing the formation of precipitants. Tanaka discloses that tin is provided to resist corrosion. Moreover, Tanaka discloses that less than 1% of tin by weight provides no improvement. Thus, there would be no motivation to one skilled in the art to include tin in amounts of less than 1% let alone in the range of up to 0.05% by weight as a strength promoter and as claimed.

In addition, the art or technology involved in Masumoto has nothing to do with high-temperature-resistant components such as gas turbine components, made from an alloy, in particular, from a nickel-base, cobalt base or iron base superalloy that is precipitation strengthened. Masumoto describes technology relating to magnetic record play-back heads of tape recorders and the like are operated in AC magnetic fields so that magnetic alloys are required to have high effective permeability and a high frequency magnetic field in good wear-resistant property because of the contact with sliding magnetic tapes. Accordingly, Masumoto has absolutely nothing to do with, disclose or suggest a superalloy that is precipitation strengthened by the addition of a strength promoter. The technology of Masumoto is unrelated to parts or components such as turbine blades that are subject to mechanical stresses and operating conditions that are far more different and extreme than play-back heads for tape recorders.

Response to Rejection II Under 35 U.S.C. §103(a)

With respect to the rejection of claims 23, 24, 26-34, 36 and 38-42, in addition to citing Burgel, Tanaka and Masumoto, the Examiner cites Clark and Schaffer. Clark discloses a filler metal used to repair a steam turbine rotor that comprises up to 0.015% by weight of tin. Schaffer teaches a starting powder blend to produce a sintered aluminum alloy, and the powder includes 0.03 to 0.15% by weight of tin. The Examiner uses a random, hindsight selection of references that disclose tin included in a composition at the claimed concentration levels; however, these references have nothing to do with using tin to enhance the formation of precipitants or has nothing to do with turbine components.

Clark does not disclose or make any reference to the use of tin as a strength promoter to enhance or increase the formation of precipitants. The use of tin (or other metals) as a strength promoter is not a trivial matter, but is an expressed limitation of the claims and cannot be ignored by the Examiner. Applicant has cited prior art that would indicate that use of tin as a strength promoter has been avoided, especially with superalloys. In paragraph 0009, U.S. Patent No. 4,708,848 is cited as disclosing tin as a constituent of a Ni-base alloy in amounts lower than the claimed concentrations indicating that the tin fraction is an undesirable impurity. In addition, U.S. Patent 6,308,767, cited in paragraph 00010, discloses a method for producing directional structures from a superalloy, in which a melt is cooled in another liquid metal. However, it is necessary to ensure that tin does not contaminate the superalloy, indicating tin is an undesirable constituent of the alloy.

With respect to Schaffer, at column 3, lines 37-40, there is discussed a material based on the "precipitation hardenable 7000 series Al-Zn-Mg-Cu alloys with trace additions of lead or tin," wherein lead is preferred to attain high sintered densities and improved mechanical properties. At column 5, lines 41-64, Schaffer discusses the industrial application of the alloys produced from the starting powder, including automotive components, recording heads for video and tape recorders and disk drive components for computers. Each of independent claims 23, 38 and 39 are directed to a gas turbine engine or component of a gas turbine engine. Applicant submits that one skilled in the art would not consider the Schaffer reference as the alloy of Al-Zn-Mg-Cu, which is not a superalloy. The alloy disclosed by Schaffer could not withstand the harsh environment of a gas turbine, and would not exhibit the mechanical properties (such as

creep resistance or resistance to extreme temperatures) necessary to meet performance requirements of a gas turbine engine.

Response Rejection III Under 35 USC §103(a)

On page 11, the Examiner rejected claim 19 as being unpatentable over Yoshinari in view of Tanaka or Masumoto. Similar to the Burgel reference, the Examiner acknowledges that Yoshinari does not disclose a super alloy that is precipitation strengthened by the addition of 50 to 2000 ppm up to 100 ppm and other claimed concentrations of the strength promoter selected from a group consisting of zinc, tin, lead, gallium, selenium and arsenic. The Examiner has applied Masumoto and Tanaka to Yoshinari as in the above rejection based on Burgel. Applicant submits that the above arguments relating to Tanaka and Masumoto apply equally to their combination with Yoshinari; therefore, the Examiner has failed to set forth a *prima facie* case of obviousness relative to the combination of these references with Yoshinari.

Response to Rejection IV Under 35 USC §103(a)

Claims 21-24, 26-34, 36 and 38-42 stand rejected as being unpatentable over Yoshinari in view of Tanaka or Masumoto or Schaffer or Clark. The Examiner has used the same rationale in the rejection that was used in the above-identified Rejection II. That is, the Examiner acknowledges that Yoshinari fails to disclose the precipitation strengthened by the addition of 100 ppm-500 ppm of a strength promoter from the group consisting of tin. In addition to relying on Tanaka and Masumoto, the Examiner cites Clark and Schaffer as secondary references. Accordingly, the arguments as set forth above with respect to Rejection II apply to this rejection; therefore, the Examiner has failed to set forth a *prima facie* case of obviousness relative to the combination of these references with Yoshinari.

Conclusion

For the foregoing reasons, it is respectfully submitted that the objections and rejections set forth in the outstanding Office Action are inapplicable to the present claims. All correspondence should continue to be directed to our below-listed address. Accordingly, Applicant respectfully requests that the Examiner reconsider the objections and rejections and timely pass the application to allowance. Please grant any extensions of time required to enter this paper. The commissioner is hereby authorized to charge any appropriate fees due in connection with this paper, including fees for additional claims and terminal disclaimer fee, or credit any overpayments to Deposit Account No. 19-2179.

Respectfully submitted,

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